RRES. CONTROL
ITGOING LTR NO.

ORF 3913

DIST.
HOFF, F.H.
EN, J.H.
ETZKE, J.C.
LINGAME, A.H.
OUCHER, D.W.
VIS, J.G.
RERA, D.W.
RRIS, L.R.
NCIS, G.E.
ODWIN, R.
ALY, T.J.
RSH, J.M. X X
RY, W.A.
JESTIC, J.R.
~~KIN, K.K.~~
LLEN, J.B.
RGAN, R.V. X X
RNELL, R.F.
TTER, G.L. X X
OADES, J.I. X X
NER, V.I.
NFORD, T.H.
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N LEUVEN, D.B.
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TCHER, D.H.
RNIVAL, G.J.
RMAN, I.K.
BERT, J.L.
FFMAN, R.B.
AMMAN, R.L.
EIG, D.M.
UDENBERG, G.E.
IMON, E.R.
WBY, R.L.
RNER, H.I.
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N REPLY TO LTR NO.

90-RF-90

R APPROVALS

RIG & TYPIST INITIALS

10370

JUL 27 1990

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

JUL 18 1990

90-RF-3913

Robert M. Nelson, Jr.
Manager
DOE, RFO

Attention: T. E. Lukow

PROPOSAL TO RECYCLE WATER FROM POND C-2

Provided below is the additional detail on our proposal to recycle water from Pond C-2. We recognize your concerns, and hope that the data provided proves ample for informed decision making.

The general concept of this project is to install a temporary surface-routed pipeline that would transport surface waters accumulating in Pond C-2 back to the plantsite for reuse in the raw water system. The raw water system services cooling towers and process applications, and is a closed loop system isolated from any contact with the domestic water supply used for showers, drinking water, or fire systems. A Pond C-2 Recycle Loop Diagram is attached to show the relationship of the Pond C-2 recycle system to the overall plantsite water flow paths.

Historically, water from Pond C-2 was discharged to Woman Creek in accordance with our NPDES Permit. As a result of the stringent new stream standards and opposition by local entities, future discharges to Woman Creek are unlikely. Current approvals to transfer this water to the Broomfield Diversion Canal will expire on January 1, 1991. Until long-term water management options are implemented, the recycle project will support Rocky Flats water management goals by providing an interim solution to water discharges to Woman Creek or to the Broomfield Diversion Canal.

The first phase of the analysis of this project addresses specific water quality concerns. Comparative water quality data have been investigated, and are summarized on Table 1 (attached). Untreated Pond C-2 water is generally of excellent quality. Only one parameter, total suspended solids, is above the Colorado Primary Drinking Water Standards. An analysis of specific water quality issues follows:

1. **Plutonium (Pu).** The previously indicated level of 0.2 pCi/l was incorrect and should have been shown as 0.02 pCi/l. This level is below the Drinking Water Standard of 0.1 pCi/l, and the Segment 4 stream standard of 0.05 pCi/l. Plutonium typically attaches to colloidal (suspended) particles in the water rather than to dissolved solids. Therefore, the concentration of plutonium in cooling tower blowdown should not change from ambient. (Cooling tower blowdown concentrates dissolved solids such as salts.)

   Assuming that the plutonium will concentrate with the dissolved solids, and a maximum of 8 cycles through the cooling tower prior to blowdown, the plutonium

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Classification Office

concentration in the blowdown would be 0.16 pCi/l. Also assuming zero dilution from other flows to the sewage treatment plant (STP), and zero plutonium removal from STP processes - both conservative assumptions - the value of 0.16 pCi/l is still well below the STP effluent control guide value of 2.0 pCi/l. Realistically, dilution from other flows, and partial removal by sedimentation and flocculation processes at the STP, are expected to result in plutonium concentrations below the 0.05 pCi/l stream standard.

2. **Comparison with existing raw water quality.** With the exception of plutonium, untreated Pond C-2 water compares favorably with the existing raw water purchased from the Denver Water Board which is now used in the cooling towers. The raw water, however, is not routinely tested for suspended (TSS) or dissolved solids (TDS), and no comparison of these parameters can be made at this time. A short-term sampling program is underway to obtain raw water TSS and TDS values.

3. **RCRA waste concerns.** Planned future discharge of treated 881 Hillside effluent water to Pond C-2 presents the potential for organic contaminants in Pond C-2. In addition, sediments in the bottom of Pond C-2 are assumed to contain unknown contaminants as a result of past incidents, and are classified as a Solid Waste Management Unit (SWMU).

   Engineering controls including a floating intake, automatic system shutdown when the pond volume reaches 10% of capacity, and buffering/sampling tanks which will be used to assure that resuspension or transport of potentially contaminated sediments does not occur. Pipeline routing adjacent to the South Interceptor Trench will ensure that any leakage will drain naturally back to Pond C-2.

   A full scale water monitoring program will be required to assure acceptable water quality for transport and use. Sampling will be required for the 881 Hillside effluent water prior to discharge to Pond C-2 water, before transport through the transfer pipeline, and at the buffering tank just prior to introduction to the raw water loop. The piping/pumping system will contain sufficient flexibility to allow installation of portable, temporary treatment units, such as microfiltration or granular activated carbon, if analyses indicate treatment is necessary.

The next phase of our analysis addresses the compatibility of the Pond C-2 recycle option with other potential water management options.

1. **Current Projects.** Previous analysis (Chart 1) has shown that the cooling towers can use all runoff accumulating in Pond C-2 from average annual precipitation plus one spring 100 year - 3 day storm event during each of the next two years. Treatment of the solar pond water, and the 881 Hillside remedial action, will have an impact on the previously examined water balance.

According to Waste Programs personnel, a total volume of three million gallons (MG) of solar pond water will require treatment through the 374 Evaporator. After treatment of the solar pond water, the evaporator product water will be used as the primary feed water for the Steam Plant Boiler. Alternatively, excess product water may then be routed to the raw water loop and cooling towers. Assuming zero boiler usage and maximum evaporator output, solar pond water will reduce the amount of Pond C-2 water that may be used by the cooling towers by three million gallons over a two month period.

The 881 Hillside remedial action is designed to operate at 30 GPM for 8 hours per day. This results in a constant additional monthly inflow to Pond C-2 of 432,000 gallons per month.

These impacts have been incorporated into a new water balance, as shown in Chart 2. The new water balance assumes that: (1) only one 100 year 3 day storm will occur in the next two years, (2) there is zero boiler usage of product water, and (3) product water usage at the cooling towers may be timed such that this flow will not occur concurrently with the storm event. Based on these assumptions, the Pond C-2 recycle system can successfully maintain the pond level below maximum capacity. Failure of these assumptions, i.e., a second 100 year storm event, or a storm event in conjunction with product water flow to the cooling towers rather than the boiler, is expected to result in overflow of Pond C-2.

2. **Long Term Water Management.** Selection of long-term water management options will require high-level DOE decision making, with significant input from EPA, CDH, the Skaggs committee, and others. Substantial funding commitments and NEPA evaluation will be required prior to implementing permanent solutions. The recycle of Pond C-2 water is a desirable permanent solution. However, funding requirements of approximately $2.6 million and concerns over wetland, floodplain, and SWMU impacts make installation of a permanent recycle system unachievable within the short time period available. Additionally, final selection of long-term water management options may exclude Pond C-2 recycle in favor of other options.

The last phase of our analysis addresses potential regulatory impacts. Regulatory considerations include compliance with NEPA, RCRA, and the existing NPDES permit.

1. **NEPA.** The concept of using a temporary installation was chosen to avoid or minimize environmental impacts. No permanent construction is envisioned in floodplains. No wetlands will be destroyed. No excavation will be required in potential SWMU areas. NEPA documentation began early in the conceptual stages of this project. An Environmental Checklist was completed, and is currently under review by the NEPA Compliance Committee.

2. **RCRA.** Based on all available data, as outlined in various sections of this letter, we do not believe the Pond C-2 recycle system will trigger provisions of RCRA. Construction in SWMUs and disturbance of potentially contaminated sediments will be avoided. Monitoring will ensure hazardous substances are prevented from entering the recycle system. In addition, discharges of water from Pond C-2 are currently regulated under the Clean Water Act through the NPDES permit, rather than under provisions of RCRA.

3. **NPDES.** The engineering controls and monitoring requirements described previously are expected to assure a high water quality more than adequate for cooling tower needs. This water will also comply with most, if not all, current NPDES discharge requirements. Because water will no longer be discharged to Woman Creek, the question of what water quality standards must now be met arises. A review and determination by regulatory entities as to whether the recycled water must comply with current NPDES discharge limitations, drinking water standards, or some other set of standards, will be required. A change in the permitted discharge point will be required as well. This will require approval from appropriate regulatory agencies.

The C-2 recycle option provides a temporary solution to pressing concerns. The recycle option can be implemented quickly, and can be operated until longer term solutions are in place. Funding requirements, including engineering and contingency, are estimated at $1.1 million. A BOA contractor (Merrick and Co.) is familiar with the scope of this project and is available for the final design services. An estimated schedule for completion of engineering and construction is 4 months from approval of funds (see attached timeline).

We request your support in expediting technical and regulatory review of this project. Regulatory determinations are a high priority and must be strongly pursued. Approval of funds is requested at the earliest possible date to allow implementation to proceed toward a December, 1990, deadline.

Please telephone Eric Mende of the Environmental Restoration/Clean Water Act Division on extension 5205 if you have any questions.

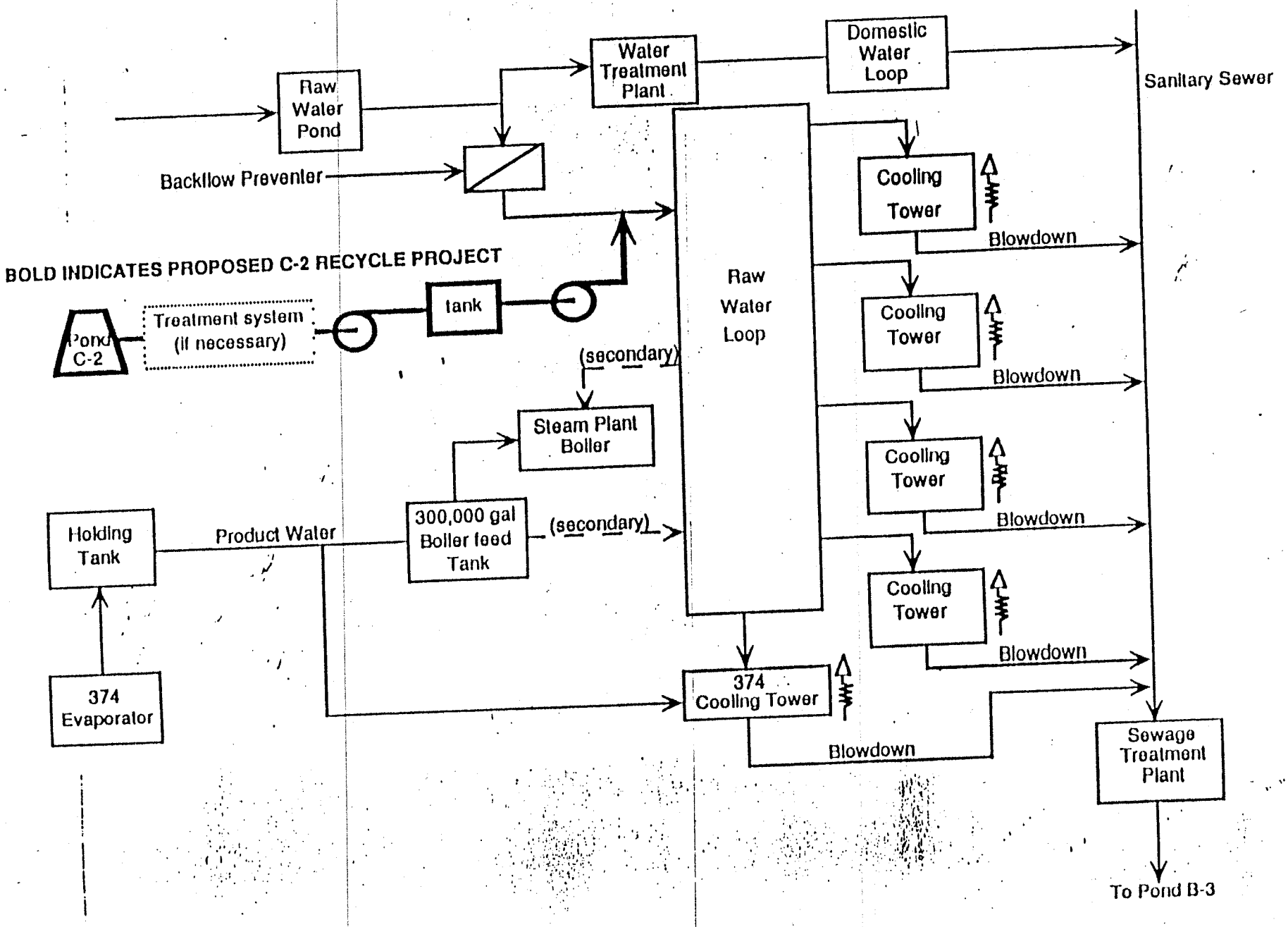
J. M. Kersh
Associate General Manager

lmc

Original and 1 cc - R. M. Nelson, Jr.

Attachment:
As stated

C-2 RECYCLE SCHEMATIC DIAGRAM



POND C-2 RECYCLE PROJECT
COMPARATIVE WATER QUALITY DATA

PARAMETER	UNTREATED C-2 AVERAGE [1]	1989 RAW WATER AVG	CO PRIMARY DRINKING WATER REGULATIONS	DISCHARGE CONTROL GUIDE	RAW WATER CONTROL GUIDE [2]	EXPECTED COOLING TWR REQMNT
Gross Alpha	5.5 pCi/l (5/90)	5	15	7 [3]	40	40
Gross Beta	9.5 pCi/l (5/90)	7	50	5 [3]	50	50
Uranium Specific	1.53 pCi/l	0.99	5	5 [3]	.02	5
Plutonium Specific	0.02 pCi/l (5/90)	0.007	0.1	0.05 [3]	.02	0.10
Americium Specific	0.01 pCi/l	0	0.1	0.05 [3]	0.5	0.10
Nitrate	<0.051 mg/l	NT	10	10 [4]	10	10
NonVolatile SS	12 mg/l (4/90)	NT	100	100 [2]	—	100
VOC's	U mg/l (1/90)	NT	5 or 10 [5]	5 or 10 [5]	—	10
Atrazine	0.72 ug/l (6/90)	NT	5.0	3.0 [3]	—	5.0
TSS	37 mg/l (6/90)	NT	30	30 [2]	—	50
TOC	NT mg/l	NT	10	10 [4]	—	10
TDS	338 mg/l (4/90)	NT	500	500 [2]	—	500
BOD_5	NT mg/l	NT	10	10 [4]	—	10
pH	NT	NT	6.5-8.5	6.0-9.0 [4]	6.0-9.5	6.5-8.5
Turbidity	NT	<1	1	5 [2]	—	5

NOTE: U = UNDETECTABLE NT = NOT TESTED

1 1989 Average unless otherwise indicated

2 Internal control guide only

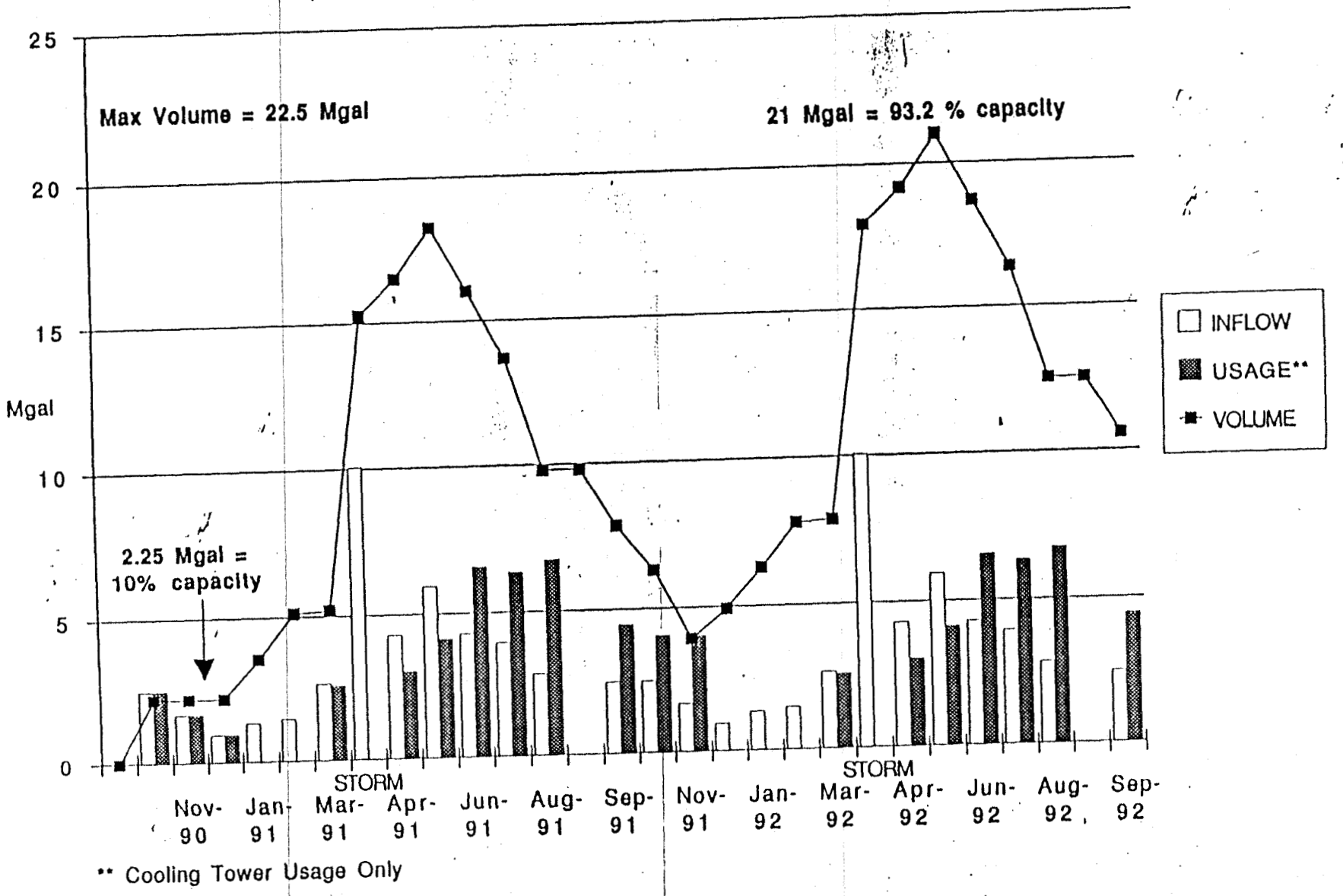
3 Colorado Water Quality Control Commission segment 4 stream standard

4 NPDES permit discharge limitation

5 Depends on specific compound

POND C-2 WATER BALANCE FOR AVERAGE RAINFALL W/ SPRING 100 YR - 3 DAY STORMS

(Inflow to C-2 vs. C.T. Usage and Resultant Pond Volume)

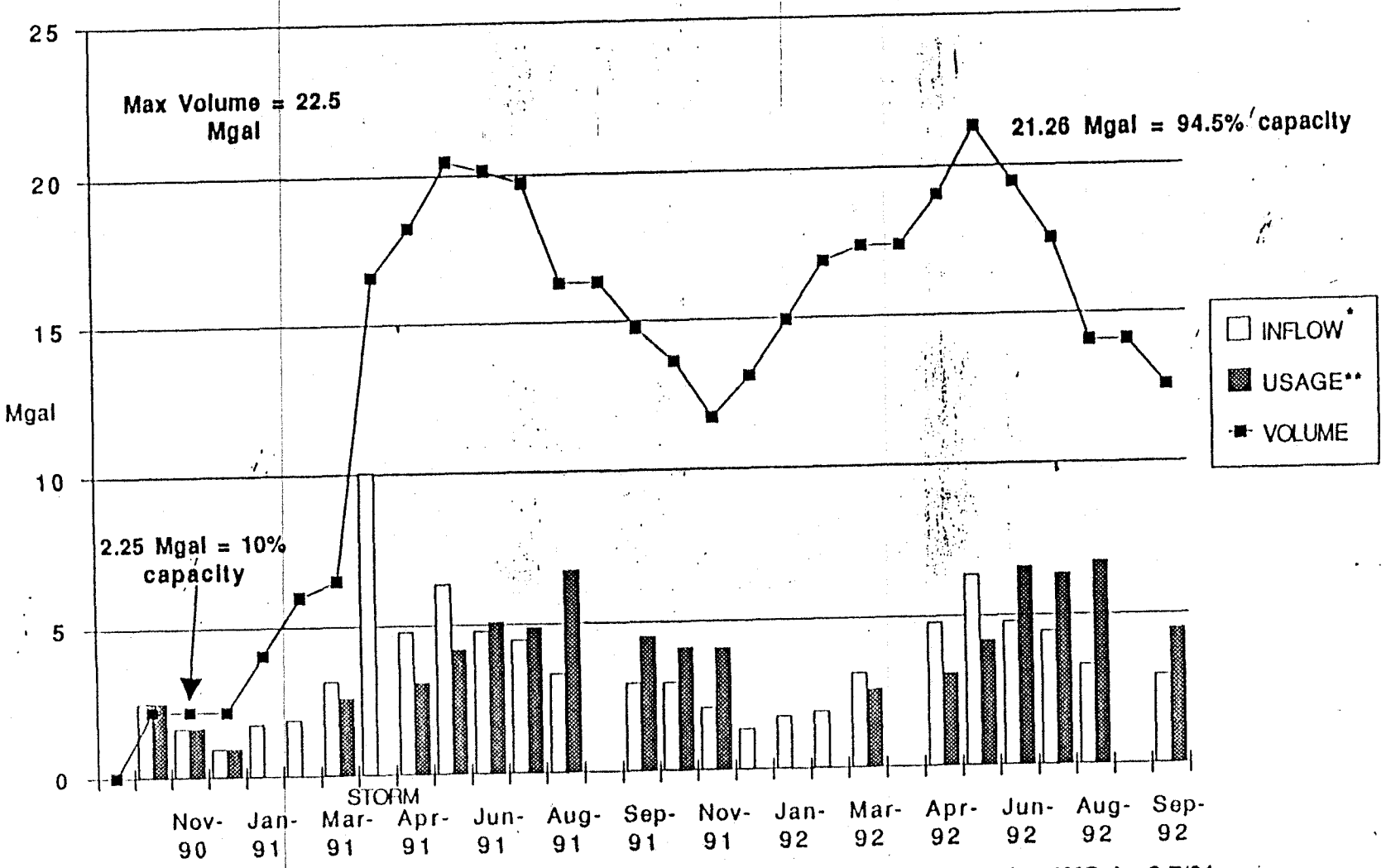


** Cooling Tower Usage Only

CHART 1

POND C-2 WATER BALANCE FOR AVERAGE RAINFALL W/ SPRING 100 YR-3 DAY STORM AND OTHER WATER CONTRIBUTIONS

(Inflow to C-2 vs. C.T. Usage and Resultant Pond Volume)



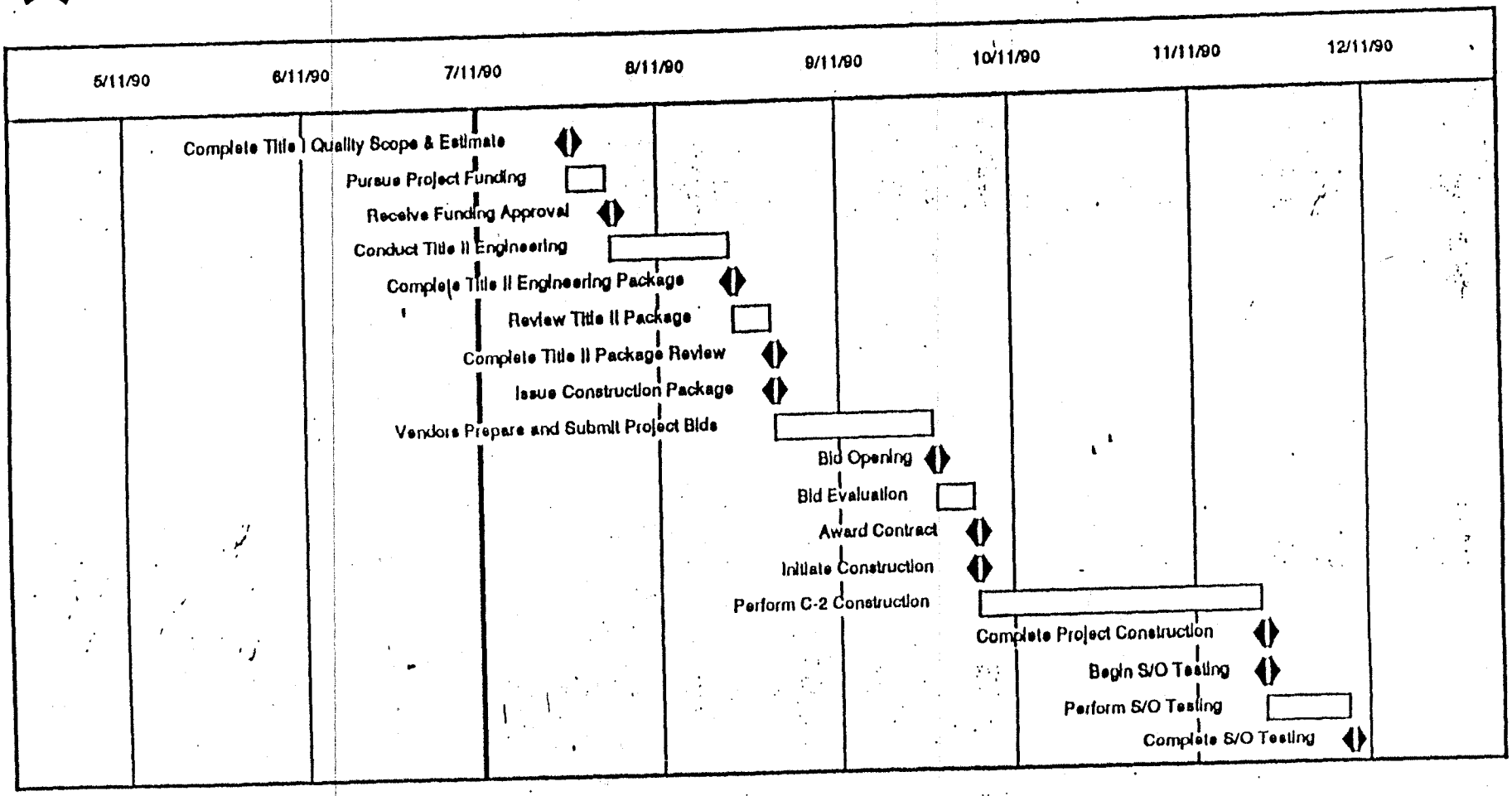
* 881 hillside contribution of .43 Mgal/mo

**Solar pond reduces usage by 3MG in 6-7/91

CHART 2

EG&G ROCKY FLATS

Pond C-2 Recycle: Design and Construction



EM C-2 Rec Sched.1b